*FlyBy Math*TM **Alignment** **Core Curriculum Content Standards for** **Mathematics**

STANDARD 4.1 NUMBER AND NUMERICAL OPERATIONS
All students will develop number sense and will perform standard numerical operations and estimations on all types of numbers in a variety of ways.

Strand 4.1.8 A. Number Sense	
Cumulative Progress Indicators	*FlyBy Math*TM **Activities**
3. Understand and use ratios, proportions, and percents (including percents greater than 100 and less than 1) in a variety of situations.	--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates. --Use calculations and experimental evidence to predict, describe, and explain several aircraft conflict problems.

STANDARD 4.2 GEOMETRY AND MEASUREMENT
All students will develop spatial sense and the ability to use geometric properties, relationships, and measurement to model, describe and analyze phenomena.

Strand 4.2.8 D. Units of Measurement	
Cumulative Progress Indicators	*FlyBy Math*TM **Activities**
4. Select and use appropriate units and tools to measure quantities to the degree of precision needed in a particular problem-solving situation.	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.
6. Solve problems that involve compound measurement units, such as speed (miles per hour), air pressure (pounds per square inch), and population density (persons per square mile).	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.

STANDARD 4.3 PATTERNS AND ALGEBRA
All students will represent and analyze relationships among variable quantities and solve problems involving patterns, functions, and algebraic concepts and processes.

Strand 4.3.8 B. Functions & Relationships	
Cumulative Progress Indicators	*FlyBy Math*TM **Activities**
1. Graph functions, and understand and describe their general behavior. • Equations involving two variables. • Rates of change (informal notion of slope)	--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates. --Interpret the slope of a line in the context of a distance-rate-time problem.

Strand 4.3.8 C. Modeling

Cumulative Progress Indicators	*FlyBy Math*TM Activities
1. Analyze functional relationships to explain how a change in one quantity can result in a change in another, using pictures, graphs, charts, and equations.	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to draw conclusions. --Interpret the slope of a line in the context of a distance-rate-time problem.
2. Use patterns, relations, symbolic algebra, and linear functions to model situations. • Using manipulatives, tables, graphs, verbal rules, algebraic expressions/equations/ • Growth situations, such as population growth and compound interest, using recursive (e.g., NOW-NEXT) formulas (cf. science standard 5.5 and social studies standard 6.6)	--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes. --Represent distance, speed, and time relationship for constant speed cases linear equations, and a Cartesian coordinate system. --Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.

STANDARD 4.5 MATHEMATICAL PROCESSES

All students will use mathematical processes of problem solving, communication, connections, reasoning, representations, and technology to solve problems and communicate mathematical ideas.

Strand 4.5 A. Problem Solving

Cumulative Progress Indicators	*FlyBy Math*TM Activities
1. Learn mathematics through problem solving, inquiry, and discovery.	--Conduct simulation and measurement for several aircraft conflict problems. --Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.
2. Solve problems that arise in mathematics and in other contexts. • Open-ended problems • Non-routine problems • Problems with multiple solutions • Problems that can be solved in several ways	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios --Use tables, graphs, and equations to solve aircraft conflict problems.
3. Select and apply a variety of appropriate problem-solving strategies (e.g., "try a simpler problem" or "make a diagram") to solve problems.	--Use tables, graphs, and equations to solve aircraft conflict problems.
5. Monitor their progress and reflect on the process of their problem solving activity.	--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.

Strand 4.5 B. Communication

Cumulative Progress Indicators	*FlyBy Math*[TM] Activities
2. Communicate mathematical thinking coherently and clearly to peers, teachers, and others, both orally and in writing.	--Predict outcomes and explain results of mathematical models and experiments. --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.
4. Use the language of mathematics to express mathematical ideas precisely.	--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system. --Predict outcomes and explain results of mathematical models and experiments.

Strand 4.5 C. Connections

Cumulative Progress Indicators	*FlyBy Math*[TM] Activities
3. Recognize that mathematics is used in a variety of contexts outside of mathematics.	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.
4. Apply mathematics in practical situations and in other disciplines.	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.

Strand 4.5 E. Representations

Cumulative Progress Indicators	*FlyBy Math*[TM] Activities
1. Create and use representations to organize, record, and communicate mathematical ideas. • Pictorial representations (e.g., diagrams, charts, or tables) • Symbolic representations (e.g., a formula) • Graphical representations (e.g., a line graph)	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.
2. Select, apply, and translate among mathematical representations to solve problems.	--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
3. Use representations to model and interpret physical, social, and mathematical phenomena.	--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.